

# “Smart” Tankless Water Heaters

Early model tankless water heaters failed to impress most U.S. consumers. But the latest new “smart” tankless water heaters appear to be changing all that.

“The older ones were more like a barbecue grill where the water ran on top of it,” says Gene Sola, owner of EZ Tankless, based in Fowler, Ind. “Newer models are more like a fuel-injected car. Units are computerized so they are smarter.”

There’s no pilot light, they self ignite, and the flame adjusts according to water volume. Models in the \$500 range can supply enough hot water for two showers running all day long.

In addition to the natural or LP gas supply, they only require 2 amps at 120V AC to run the exhaust fan and computer. Installation is easy, too, with a dual-chamber 4-in. forced air intake and exhaust pipe.

EZ Tankless also has battery-ignited outdoor models (pictured) starting at \$165 for camping, hunting cabins, or other remote areas without electricity.

To ensure the tank’s life of 20 years or more, Sola recommends filtering the water going into it. His website includes detailed information and videos of how to filter water, as well as how to install and maintain the tankless system.



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Reader Inquiry No. 31

## Ditch Witch Converted To Mini-Grader

Frank Smith’s Cub-powered grader (Vol. 45, No. 3) inspired Lester Adelman to build his own 15-ft. grader. Instead of a Cub, Adelman based his on a 1980’s Ditch Witch and a 3-pt. mounted 8-ft. blade. Adelman admits the project was made more complex as he had no blueprint or plan.

“I graded township roads for 12 years, so I knew what it should look like when it was done,” he says. “When finished, I had a made-from-scratch, working, self-propelled road grader. Not bad work for an 87-year-old.”

He started by stripping the Ditch Witch down. The front axle was among the parts removed. He also modified the tandem rear axle into a single axle with duals for easier turning.

Adelman extended the frame with a bridge fabricated from an old 4 by 6-in. steel tubing disc frame. The rear bridge upright is welded to the Ditch Witch frame. At the front, the gusseted vertical arm drops down to a front axle and subframe salvaged from a Ford tractor. On the tractor, the subframe is bolted to the tractor for switching from narrow to wide front ends.

“The Ford had 16-in. wheels that I cut down to match the 12-in. drive wheels on the rear axle,” says Adelman. “I bought a pair of 13-in. wheels from a neighbor, cut the centers out of both sets, and welded the Ford wheel centers into the 13-in. wheels.”

Adelman used a steel plate as a transition point between the bridge and the front axle. He welded the bridge vertical to the top side and bolted the Ford subframe with its axle to the underside.

The plate was one of the few pieces Adelman purchased new, and it required fabrication. “The iron shop didn’t have a piece wide enough for the plate I wanted, so I bought two pieces and welded them together,” says Adelman. “I cut out the shape and drilled it to match the bolt hole

on the Ford front-end subframe.”

To mount the blade to the bridge, Adelman fabricated a box frame over the blade’s original 3-pt. V-frame and blade turntable. He also removed the no-longer-needed 3-pt. ears from the V-frame.

The blade hangs from hydraulic cylinders with 8-in. reach, attached to 2 by 4-in. steel tubing welded over the top of the bridge. The weld is reinforced by gusset plates to either side of the bridge.

Adelman wrapped strips of flat iron around the cylinders and bolted them tight to the cylinders. The ends of the strips are in turn secured by a single bolt in the open ends of the 2 by 4 tubing.

The box frame over the V-frame is connected to the pivot plate over the front axle with a ball hitch. This allows the blade to pivot up and down and sideways while maintaining a uniform distance from the front end.

While looking for parts at a salvage yard, Adelman saw a steering system from a Deere combine. The steering column had hydraulic levers to raise and lower the header and the reel. Eyeballing it, he thought it would work for the blade lift cylinders. He mounted the steering column just behind the rear post of the bridge. The levers were one-way valves. Adelman converted them to two-way so he could raise and lower the blade cylinders separately for angled grading.

The hydraulic steering system was easy to adapt to the grader. “I installed a cylinder on the front end and tied it into the tie rods,”



Adelman used an 80’s Ditch Witch as the base for his grader with an 8-ft. blade.

says Adelman. “Instead of controlling a rear axle, the wheel controls the front axle.”

When he hooked it up to the Ditch Witch hydraulics, he ran into a problem. As he turned the wheel to bleed the air out of the system, he heard a loud crack. His local Deere dealer suggested the oil was too heavy. That didn’t make sense, so he went to Central Hydraulics. They explained the problem.

“It was a closed center hydraulic pump, and the oil had nowhere to go on the steering system,” says Adelman. “Central Hydraulics helped me order a relief valve, as well as sketching out where it needed to go.”

Adelman painted the mini-grader Case orange and white in keeping with a Case emblem on the rear of the Ditch Witch.

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